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Warnings and Precautions

The following symbols indicate important safety warnings and precautions throughout this manual.

They are defined as follows:

	WARNING indicates that serious bodily harm or death may result from failure to adhere to the precautions.

	CAUTION indicates that damage to equipment may result if the instructions are not followed.

	NOTE suggests optimal conditions under which the equipment will operate effectively and safely.

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Table of Contents

Warnings and Precautions 2

Introduction 4

Overview 4

Description of the Interface 4

Function Buttons 4

Navigation Buttons 5

Installing ControlPAK 6

Technical Specifications for Installing ControlPAK 6

Configuring an Ethernet Radio 7

Entering Configuration Mode 7

Configuring Basic Settings 8

Creating Your System Configuration 11

Configuring a Zone Schedule 12

Setup the WEB I/O Clock 12

Create a New Schedule with the Schedule Wizard 13

Create a New Schedule by Manual Entry 15

Using the Local I/O 16

Installing an I/O for Feedback on the Website 16

Changing the User Name and Password 16

Configuring the Radio through the Webpage 17

Accessing the Radio Webpage 17

Description of the Interface 17

Radio Function Buttons on Web Page 17

Navigation Tabs on Web Configuration ... 18

Configuring the Basic Settings on the Webpage 19

Creating Your System Configuration on the Webpage 19

Configuring a Zone Schedule on the Webpage 19

Testing 20

Testing a Wireless Link 20

Optimizing a Wireless Link 20

Troubleshooting 22

Appendix A: RF Exposure 23

FCC 23

Health Canada 23

Appendix B: Declaration of Conformity 23

FCC 23

Warning (Part 15.21) 23

Industry Canada 23

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Introduction

Overview

The ENCOM WEB I/O provides flexible central control monitoring capabilities for up to 255 remote Contact Closure Radios. Common applications include school zone flashers, Fire Hall pre-emption systems and highway warning signals and Advanced Warning systems.

This manual is a guide and reference for programming the ENCOM WEB I/O Radio.

This manual contains instructions, suggestions, and information which will guide you to set up and achieve optimal performance from your equipment.

Description of the Interface

This section describes the primary features of the ControlPAK *Main Configura*tion screen.

Function Buttons

The bottom of the *Main Configuration* screen contains a series of function buttons. They are described in the following table:

Button	Description
	Save To File saves your customized radio configurations. After you **Save To File,** you can copy your custom configuration to other radios on your network. **NOTE:** The radio is not programmed until you click **Program Radio**.
	Read From File uploads radio configuration data from a file into ControlPAK. This allows you to copy a configuration to another radio. **NOTE:** The radio is not programmed until you click **Program Radio**.
	Current Settings uploads a radio's current configuration data into ControlPAK. If you create a custom configuration and make an error, click **Current Settings** to replace the parameters that are currently displaying on-screen to the settings currently on the radio.
	Program Unit downloads your current on-screen configuration to a radio. You must click **Program Unit** each time you want to download a configuration to a radio; **Save To File** only saves a file to a folder.

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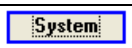
	Reset to Default resets the radio's configuration to the factory's default parameters. **NOTE:** The radio is not programmed until you click **Program Radio**.
	Return to LAN Search returns you to the *ControlPAK LAN Search* screen to program another radio, check *System Status* or return to the *ControlPAK Login* screen.

Navigation Buttons

There are six Navigation Tabs on the ControlPAK WEB I/O interface that are located across the top of the screen.

Button	Description
	There are three sections of the Basic Settings Tab: ➢ Unit Information ➢ Wireless Setup ➢ IP Setup The *Unit Information* is used to change the name of the WEB I/O Radio. The *Wireless Setup* section is used to select the Network Address, Hop Pattern, and Output Power. A Unit Address of 0 will always be assigned to a Master WEB I/O unit. The *IP Setup* is used to select either a Static Address or DHCP Address.
	The *System Tab* is used to add the remotes to a Zone that communicate with the WEB I/O radio.
	There are two sections of the *Calendar Tab*: ➢ Real Time Clock Setup ➢ Scheduler The *Real Time Clock Setup* can use the PC Time or a Network Time Server. The *Scheduler* section is used to add in a user defined schedule.
	The *Local I/O Tab* allows for the inputs and outputs to enabled/disabled.
	The *Security Tab* allows for the User Name and Password to be changed.
	Provides you with information about your radio, and also allows you to upgrade the radio's firmware.

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Installing ControlPAK

Before you can perform a configuration, you must have the radio connected (refer to the previous chapter), and you must install the ControlPAK software.

The disc located in the back pocket of the Installation Guide contains the ControlPAK software. Alternatively, you can download the most recent version from our website at www.encomwireless.com. Ensure you are using ControlPAK version 4.4.0 or higher.

Technical Specifications for Installing ControlPAK

To run ControlPAK on your PC, you require the following hardware and software:

- Windows XP or Windows Vista
- 1GB RAM
- 100 MB free hard drive space
- Microsoft .NET framework 2.0

After downloading the latest version of the ControlPAK software from www.encomwireless.com:

1. Click **Setup**
   The *ControlPAK Install* screen appears.
2. Click **Next**.
   The *ControlPAK Software License Agreement* screen appears.
3. Click **I agree**, and then click **Next**.
   The *Upgrade/Uninstall* screen appears.
4. Click **Next**.
   The *Select Directory* screen appears.
5. Enter the directory in which you would like the ControlPAK software install, or click **Next** to accept the default directory.
   The *Start Copying Files* screen appears.
6. Click **Next**.
   The Setup file copies the appropriate files to your computer, and then registers the software.
7. At this point, if you are running Windows Vista, you must turn off your Use Account Control. Instructions to do this are located at http://windowshelp.microsoft.com/Windows/en-US/help.
8. Click **Next**, then click **Finish**.
   The ControlPAK icon appears on your desktop.
   Note: If you haven't yet turned off your User Account Controls, you must do so now for the ControlPAK software to work.

Congratulations, you have successfully installed ControlPAK.

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Configuring an Ethernet Radio

The first step in using ControlPAK to configure your radio is to enter the proper configuration mode. There are three options available from the main screen: **ETHERNET**, **SERIAL**, and **CONTACT CLOSURE**.

Entering Configuration Mode

To enter Configuration Mode:

1. From your desktop, double-click the **ControlPAK** icon.
   The *ControlPAK main* screen appears.

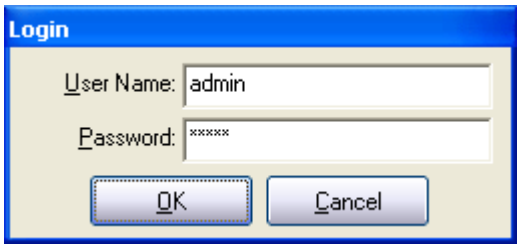
2. Click **ETHERNET**.

3. Click **ALL ETHERNET**.

The ControlPAK software loads, and then the *ControlPAK LAN Search Home* screen appears.
The *Real Time Network Scan* list section of the screen updates and displays all the Encom radios that are currently part of your radio network.

NOTE	If your Encom Radio does not appear in the *Real Time Network Scan List,* click Refresh (located in the upper left hand corner of the Real Time Network Scan List). ControlPAK scans your network to discover the unit.

4. Highlight the **WEB I/O Radio** you want to configure and click **Configure** (located in the bottom right corner).
   The **Login** dialog appears:



5. The default User Name and Password is: **admin**. Click **OK**.
   An information box appears to update you on what is currently happening with your software.

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NOTE	After the information dialog box disappears, if there is updated firmware available, the *LANPak* screen appears. Click **Yes** to update the firmware on your radio. Refer to the section on *Upgrading Firmware* for more information.

6. After you click **OK,** the *Main Configuration* screen appears for your specific radio. This is where you configure the radio.

Configuring Basic Settings

The *Basic Settings* page allows you to configure your radio's name, network address, hop pattern, output power, and the IP Setup.

1. After you reach the *Main Configuration* screen, you can start to configure your radio's settings. The first page that appears is the *Basic Settings* page.

2. Complete the following fields on the *Basic Settings* page (refer to the table on the following page):

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Section	Field Name	Description
Unit Information	Unit Description	Enter a description (up to a maximum of 50 characters). The radio description name you type in displays in the *Real Time Network Scan List*.
Wireless Setup	Unit Address	This field will be greyed out as the system defaults the Master radio to a unit address of 0. This cannot be overridden.
	Network Address	This field allows the user to select an address number that is associated to a particular radio network. By default this is 0. If you have more than one network it is recommended to have a different address for each network. The network address needs to match each radio in the particular network.
	Primary Hop Pattern	This field is selectable to allow a particular hop pattern to be used for the network. By default this is 11. It is recommended to select a hop pattern that is away from other hop patterns of Encom equipment. The primary hop pattern needs to match each radio in the particular network.
	Repeater Use in System	This field is to be check mark enabled if one or more WBCU radios are to be a Repeater in your system. Failure to enable this option on this Master WEB I/O can cause incorrect communication to occur.
	Output Power & RF Noise Filter	Adjustable output power up to 1W maximum and 1mW minimum. The RF noise filter is to be enabled if the system has a strong receive signal. By enabling the noise filter will improve data integrity.

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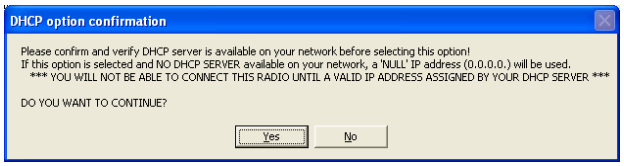
IP Address Setup	Obtain an IP Address automatically	Your radio requires an IP Address to communicate through the Ethernet LAN Port. Using the *Obtain an IP Address automatically* option causes your network's DHCP server to automatically assign your radio an IP Address. The following message appears to confirm that a DHCP server is accessible prior to changing the IP Address Mode to "DHCP". 
	Use the Static IP address	Use this option when you have the IP Address, Subnet Mask, and Default Gateway information provided by your I.T. department. Then complete the IP Address, Subnet Mask and Default Gateway fields with the information provided by your I.T. department.

3. After you finish configuring the radio's Basic Settings, you have several options.
   - If you are configuring a new radio, then continue to the **System** tab.
   - If you are editing an existing radio configuration and would like to save your new configuration to a file (to share with other radios on your network), click **Save to File**, then click **Program Radio** to upload the new configuration to the radio.
   - If you would like to program your new configuration to the radio, click **Program Radio**. Note that this will not save the new configuration to a file; to do that you must first click **Save to File**.

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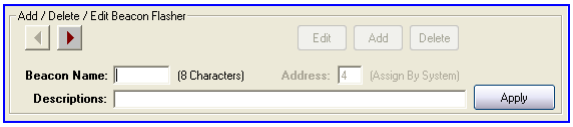
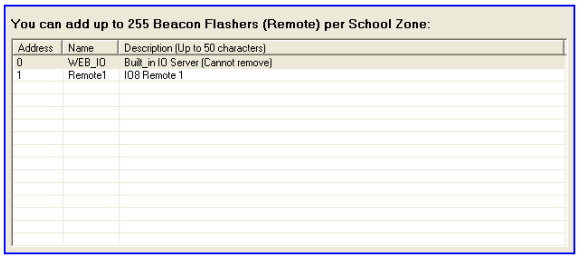
Creating Your System Configuration

In order for the WEB I/O to communicate to the remotes of a particular network, a system needs to be created with a Master and Remote radios.



2. Each Remote that is added its entry will be placed in the System List.



Once all the radios have been added to the System List, a schedule can be created for the System.

1. Highlight the WEB I/O and the Add Button will become highlighted and allow remote entries to be added.

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Configuring a Zone Schedule

Each System, which consists of a network of radios, is considered a Zone. For each zone that is present a schedule can be added in. The schedule is then able to be downloaded to the remote radios that the WEB I/O unit controls out in the field.

The ***Calendar Tab*** allows the following schedule abilities:

- Setup the Real Time Clock by PC Time or by an NTS Server
- Create a New Schedule
- Import an existing Schedule
- Modify an existing Schedule

Setup the WEB I/O Clock

The WEB I/O clock is to be synchronized in time in order to have the scheduled times turn on/off as desired. If the Time Zone is not correct or the PC time has changed it will affect the turn on time.

1. Place a check mark in the **Use PC Time to update clock box.**
2. Press the *Update Now* button to synchronize the time with your PC. This will also add a Network Time Server to be used against if your PC time changes.
3. Select the correct Time Zone you are in.

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Create a New Schedule with the Schedule Wizard

1. Enable the schedule option by placing a check mark in the Enable Schedule box.

2. From the ***Calendar Tab***, select the *Schedule Input Wizard* to Create a New Schedule. You will be taken to the *Schedule Input Wizard* screen.

3. Select the **ADD** Button to highlight the Add/Delete/Edit Schedule Events field. Complete the following fields on the *Add/Delete/Edit Schedule Events* field (refer to the table on the following page):

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Section	Field Name	Description
Schedule Information	Comment	Enter a radio description (up to a maximum of 50 characters). Place a check mark in the Enable box beside the Comment field.
Schedule Date & Time	Start Date	Select the starting date for your scheduled events from the drop down calendar menu. The format will be represented as day/month/year.
	Stop Date	Select the ending date for your scheduled events from the drop down calendar menu. The format will be represented as day/month/year.
	Start & Stop Time	The Start Time is in a 12-hour format and is user defined by highlighting the selected entry and scrolling to the time to be applied on the Start Date. The Stop Time is in a 12-hour format and is user defined by highlighting the selected entry and scrolling to the time to be applied on the Stop Date.
Daily Event	Running Mode	**The Running Mode allows the user to choose what days during the Start and Stop Dates the event is to occur**. The events can occur on a Weekly or Special Occasion basis. **Weekly Running Mode:** Select the day option that the event is to occur on. **Special Occasion:** Select this option if you would like to add a Holiday or an All Day Event to the schedule. An All Day Event for example could be Parent/Teacher Interviews.

4. After you finish adding in the Date and Time of your Scheduled Events, you have a few options:

   - **Add in more Scheduled Events to this schedule**. If you would like to add in more events to this schedule click the ADD button to enter in additional events.

   - **Save the Current Schedule**. **It is highly recommended to save your Schedule at all times.** This should be stored in a directory on your computer for later access if needed. Use the **Save to File** button to save your schedule.

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Create a New Schedule by Manual Entry

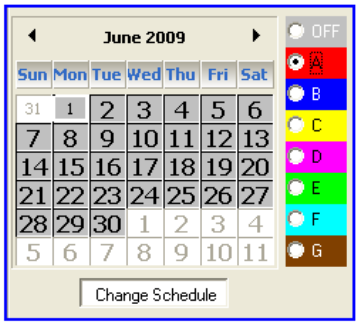
An alternate method allows for a schedule to be manually entered in the WEB I/O. A manual entry is useful if you need to add an extra time slot to a particular schedule but still would like to maintain the original schedule.

A time group is denoted by the letters A to G and each group can have up to eight events. Only one time group can be used on a particular day.

To set a manual entry:

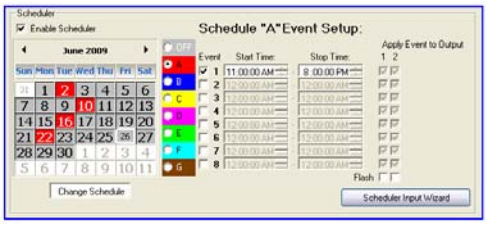
1. Select the *Change Schedule* button and this will activate the time group letters.

2. Select a time group, i.e. “A”. This will highlight the Event option:



3. Place a check mark in the event number that is to be used. This will enable the start/stop time to be added for the event. Select the desired start/stop time for the event.

4. Add the new event to the calendar by clicking on the days that the event is to occur on.



5. When the event has been added to the days on the calendar, de-select the *Change Schedule* button.

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Using the Local I/O

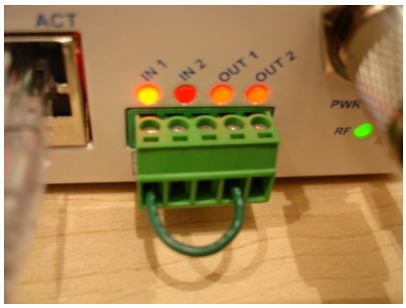
The WEB I/O radio has local inputs and outputs for various uses. The Local I/O on the radio can be enabled to allow a physical switch to be added to the system. As well, this local I/O can be used to have a physical feedback loop applied to have confirmation back on the website or physically on the device.

Installing an I/O for Feedback on the Website

For the WEB I/O to have a feedback confirmation on the radio webpage a feedback loop is physically required for a connection point.

On the front of the WEB I/O radio a physical wire is to be connected from output 1 to input 1. This will provide a feedback and the I/O status can be viewed on the radio webpage.

The physical wire is depicted below:



Changing the User Name and Password

The security settings of the radio, *user name and password*, are user defined and able to be changed.

The user name and password of the radio can be changed by selecting the **Security Tab** located at the top.

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Configuring the Radio through the Webpage

The WEB I/O provides a central control for multiple CommPAK I/O8 remotes through a web interface.

From the internet browser the IP address of the WEB I/O radio can be entered in.

Alternatively the webpage can also be accessed by right clicking on the radio unit in the ControlPAK LAN Search Page and bringing up the pop up menu.

It is recommended to refer to the section of interest previously in the manual as the web page interface and navigation is a mirrored image from the ControlPAK software.

Accessing the Radio Webpage

Enter the IP address on the internet browser to begin logging into the WEB I/O radio unit:

A login prompt will appear asking for the user name and password. Refer to the section on *Entering Configuration Mode* for the default user name and password.

Connect to 172.16.20.167
The server 172.16.20.167 at NA-HTTP AWS Realm requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
admin
Password:
Remember my password
OK
Cancel

Description of the Interface

This section describes the primary features of the *Radio Webpage* screen.

Radio Function Buttons on Web Page

The left side on the *Current Status* page contains a series of function buttons. They are described in the following table:

Button	Description
Current status	**Displays the real time status of the radio network.** The status of each radio will be displayed on the COM Status. The I/O status will be displayed on the Status.
Configuration	The following configurations can be accessed: ➢ Basic Settings ➢ System ➢ Scheduler ➢ I/O Mapping ➢ About
Override	Allows for a radio or an entire radio system to be manually overridden from its current status.
Logout	Logout of the Radio web page

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Navigation Tabs on Web Configuration

There are five Navigation Tabs on the web page configuration interface that are located across the top of the screen.

Button	Description
Basic setting	There are three sections of the Basic Settings Tab: ➢ Unit Information ➢ Wireless Setup ➢ IP Setup The *Unit Information* is used to change the name of the WEB I/O Radio. The *Wireless Setup* section is used to select the Network Address, Hop Pattern, and Output Power. A Unit Address of 0 will always be assigned to a Master WEB I/O unit. The *IP Setup* is used to select either a Static Address or DHCP Address.
System	The *System Tab* is used to add the remotes to a Zone that communicate with the WEB I/O radio.
Scheduler	There are two sections of the *Schedulerr Tab*: ➢ Real Time Clock Setup ➢ Scheduler The *Real Time Clock Setup* can use the PC Time or a Network Time Server.
	The *Scheduler* section is used to add in a user defined schedule.
IO Mapping	The *IO Mapping Tab* allows for the inputs and outputs to enabled/disabled.
About	Provides you with information about your radio, and also allows you to upgrade the radio's firmware.

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Configuring the Basic Settings on the Webpage

The *Basic Settings* page allows you to configure your radio's name, network address, hop pattern, output power, and the IP Setup. Refer to the section on *Configuring Basic Settings*.

Creating Your System Configuration on the Webpage

In order for the WEB I/O to communicate to the remotes of a particular network, a system needs to be created with a Master and Remote radios. Refer to the section on *Creating Your System Configuration*.

Configuring a Zone Schedule on the Webpage

Each System, which consists of a network of radios, is considered a Zone. For each zone that is present a schedule can be added in. The schedule is then able to be downloaded to the remote radios that the WEB I/O unit controls out in the field. Refer to the section *Configuring a Zone Schedule*.

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Testing

Testing a Wireless Link

Use the following procedure to test a wireless link:

NOTE: Always perform these test on a bench or in a lab setting before field deploying your system.

1. **Program** the WEB I/O with the same hop pattern as the Remote(s) and a simple default schedule. Program the WEB I/O which will download the schedule to the Remote.
   Working with two radios helps you understand their basics features and functionality.
   The WEB I/O should appear in the *Real Time Network Scan List* field (located in *Ethernet* → *All Ethernet*).
2. Open the **Radio Webpage** and check the COM Status.
   If the radios can "see" each other, the COM Status will appear as OK. When the schedule is active the Status will be set to ON.
3. **Override** the operation of the Radios to verify the complete Status and communication of the Radios.

Once you understand how the two radios should work, repeat this test process with each additional radio you plan to add to the system.

Optimizing a Wireless Link

After testing your Wireless Link to determine it is working, use the following procedure to optimize your Wireless Link among the radios in your system.

NOTE	Perform this procedure in the field; in a lab setting you should always have near-perfect results.

When mounting the remote radio antennas:

- Mount the antennas on the highest possible point; for example, the luminaire of a traffic light.
- Mount the antennas with a clear line of site to one another.
- Make sure the polarization of each antenna matches for the entire system; for example vertical or horizontal, no mix.

1. Use the **Antenna Alignment** tool/**Site View** to determine the system's current Connection Quality and Signal Strength.
2. Run the **Antenna Alignment** tool with each Remote radio and check the Connection Quality and Signal Strength back to the Master radio.

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3. Manually adjust the Remote location's antenna (first on the horizontal plane and then on the vertical plane (if necessary)) to achieve the highest possible Connection Quality and Signal Strength.
4. Physically tighten the antenna connections and move on to the next remote location. Repeat this procedure at each Remote radio site.

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Troubleshooting

For troubleshooting tips on the WEB I/O, please visit the Frequently Asked Questions page:

http://www.encomwireless.com/support/frequently-asked-questions

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Appendix A: RF Exposure

FCC

This equipment has been designed to comply with FCC RF exposure requirements outlined in Parts 2.1091, 2.1093, and 15.247(b)(4). Deviation from the recommended installation may violate RF exposure requirements.

To comply with FCC RF exposure requirements for mobile transmitting devices, only use or install this transmitter at locations where there is at least 23cm (9") separation distance between the antenna and all persons.

Health Canada

The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's website www.hc-sc.gc.ca/rpb.

Appendix B: Declaration of Conformity

FCC

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference
(2) This device must accept any interference received including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Industry Canada

This device complies with Industry Canada RSS-210 specifications

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ENCOM Wireless, based in Calgary, Canada, provides field-proven, cost-effective wireless data solutions for municipal and industrial clients, with applications in the areas of:

* Intelligent Transportation Systems
* Public safety communications
* Municipal corporate security and IT networks
* Water and waste water management
* Electrical utilities
* Oil and gas

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